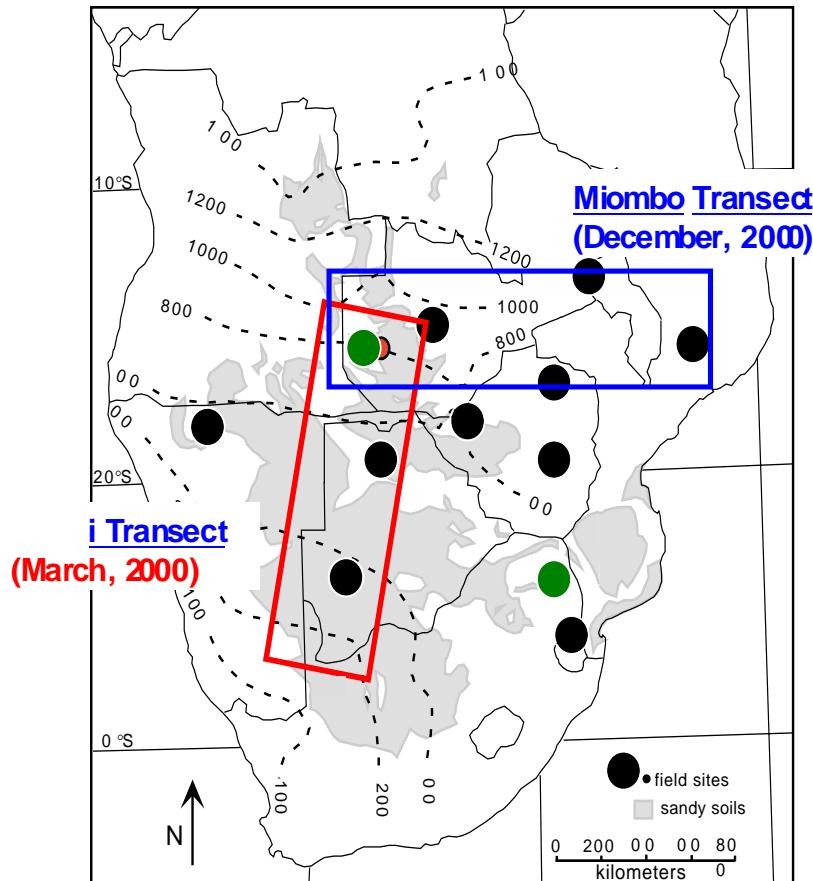


# Southern African EOS Validation Activities & Points of Contact

- SAVE - Jeff Privette (privette@chaco.gsfc.nasa.gov)
- MODIS Fire Validation - Chris Justice (justice@kratmos.gsfc.nasa.gov) / David Roy (droy@kratmos.gsfc.nasa.gov)
- Vegetation Structure Characterization - Kelly Caylor (kkc9q@virginia.edu)
- Continuous Fields Analyses / % Tree Cover - UMD (Hansen/Defries)
- Moisture Characterization - Ana Pinheiro (ana@fado.gsfc.nasa.gov)
- SAFARI 2000 - Bob Swap (swapper@virginia.edu) / Tim Suttles (tim.suttles@gsfc.nasa.gov)
- NASA ER-2 - Michael King (king@climate.gsfc.nasa.gov) / Steve Platnick (platnick@climate.gsfc.nasa.gov)
- Convair 580 - Peter Hobbs (phobbs@cargsun8.atmos.washington.edu)
- SAWB Aerocommanders - Stuart Piketh (stuart@crg.bpb.wits.ac.za) / Bob Swap(swapper@virginia.edu)
- Ozone / SHADOZ - Anne Thompson (thompson@gator1.gsfc.nasa.gov)

## SAFARI 2000 Core Field Sites and Transects



### Intensive Field Campaigns

IFC	Name	Timeline	Emphasis
1	Pilot	August/ September, 1999	Intensive instrument deployment and measurements at two sites
2	Kalahari Transect	February/ March, 2000	Mobile characterization of canopy structure and flux over <a href="#">IGBP Kalahari Transect</a>
3	Fire	August/ September, 2000	Fire and emissions transport analysis with ER-2 and 3 other aircraft
4	Miombo Transect	November/ December, 2000	Mobile characterization of canopy structure over <a href="#">IGBP Miombo Transect</a>

Please see <http://safari.gecp.virginia.edu> and  
<http://modarch.gsfc.nasa.gov/MODIS/LAND/VAL/terra/privette>

Anticipated field work for March SAFARI 2000/  
SAVE campaign: (UVA Group)

(All data collected will be shared directly with  
SAFARI 2000 collaborators, under the data  
policy outlined in the SAFARI 2000 Science  
Plan)

Sites:

Bokspits	Botswana	-26.83	20.74
Tshane	Botswana	-24.01	21.56
Okwa River Crossing	Botswana	-22.50	21.83
Maun flux tower site	Botswana	-19.83	23.50
Kasane National Park	Botswana	-17.78	25.18
Mongu tower site	Zambia	-14.45	23.25

## **Structural data to be collected (Cayl or):**

Tre e basal area and cover; Grass biomass; Tree cores - Growth increments, Sapwood area; Coarse root distribution; Species composition and dominance; Tree height, Crown base diameter; Stem maps

## **Biogeochemical data to be collected (Aranibar):**

Soil texture, organic C, C:N ratio; Nitrogen mineralization; C & N isotopes of soil, tree and grass material; Land-use emphasisized in sampling strategy

## **Canopy flux data to be collected (Scanlon):**

CO<sub>2</sub>, Heat, H<sub>2</sub>O flux; Net radiation; IR skin temp of leaves, soil, woody material; Soil temperature profile; Soil moisture profile

## **Additional data:**

Leaf-level fluxes (Dowty); Canopy spectral properties (Gu); Aerosol properties (Billmark)

## **Ecological modeling of savanna ecosystems:**

Point-level photosynthesis processes (Gu); Patch-level photo-synthetic efficiency (Dowty); Regional-level vegetation structural dynamics (Caylor)

## **Additional Groups:**

Soil moisture (Pinheiro); Spectral structural characterization, Remote-sensing, AOT (Privette); LAI-FPA R (Myneni); NO<sub>x</sub> flux (Oster)

# **MODIS Fire Validation: SAFARI 2000**

(Justice/Giglio/Roy et al.)

- **Active Fire Product**
  - comparison with AVHRR SAFARI fire fields (Starr/Tucker)
  - ASTER acquisitions for SAFARI sites (Mongu/Skukuza)
  - MAS fires of opportunity during SAFARI intensive (Aug/Sept 2000)
- **Ward/Hao (Validation Scientist ) – SAFARI fire activity -TBD**
- **Burned Area Experimental Product**
  - Landsat burn scar mapping as a validation for MODIS product
  - Fire validation sites selected Zambia, South Africa, Zimbabwe, Mozambique, Botswana, Namibia?
  - In-country collaborations formulated through MIOMBO Network Fire Group to participate in Landsat 7 scar assessment and MODIS product evaluation
  - Field protocol development in late June (Zambia, Zimbabwe)
  - Validation intensive (August – September)
  - Results meeting – January 2001
- **International coordination –**
  - ATSR comparison through the CEOS GOFC Fire activity (Periera)
  - CEOS Validation WG Meeting, March 2000 – GOFC Fire validation

# SAVE / SAFARI 2000 SOIL MOISTURE MEASUREMENTS

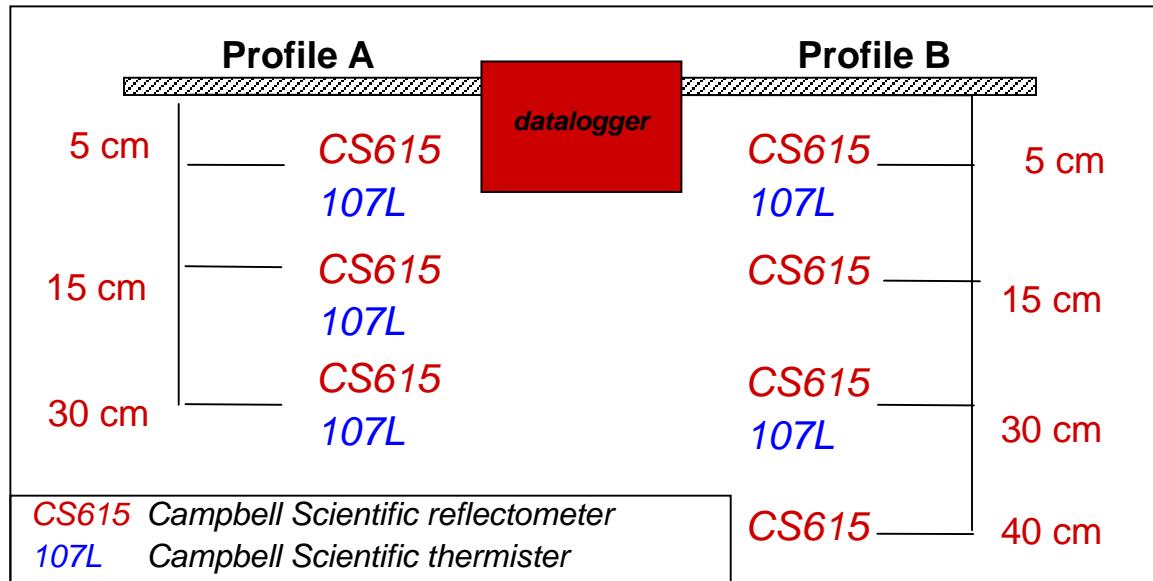
Ana Pinheiro

ana@fado.gsfc.nasa.gov

	Skukuza	Mongu	Maun	Kalahari T.
<b>Profiles (temporal variation)</b> *				
CS615 Campbell Scientific reflectometers	x	x	?	
107L Campbell Scientific thermisters				
<b>IFC1(spatial variation)</b> gravimetric measurements				
<b>IFC2 (spatial variation)</b> gravimetric measurements	x	x	x	x
<b>IFC3 (spatial variation)</b> gravimetric measurements	?	?	?	

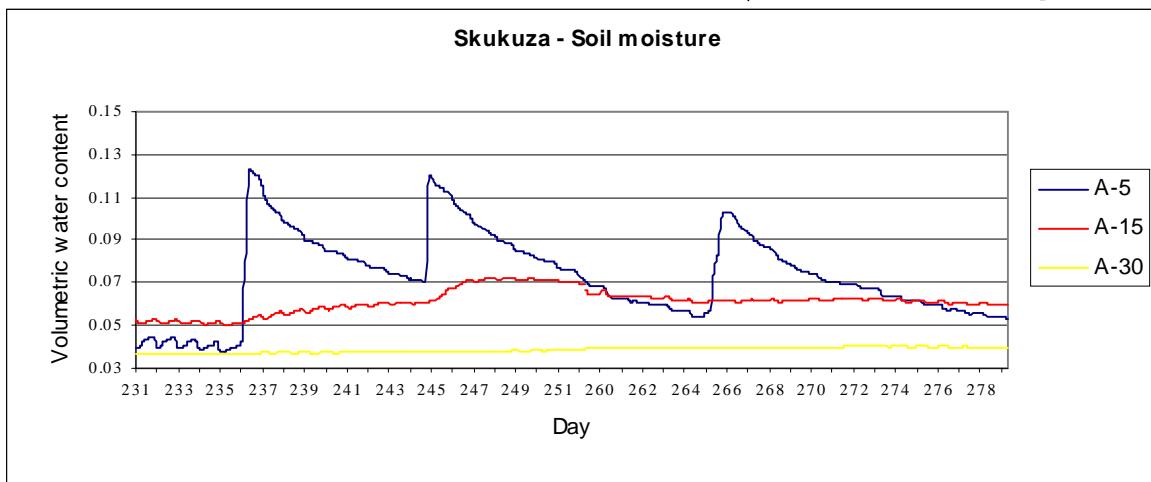
\* Frequency: 1/2 hour

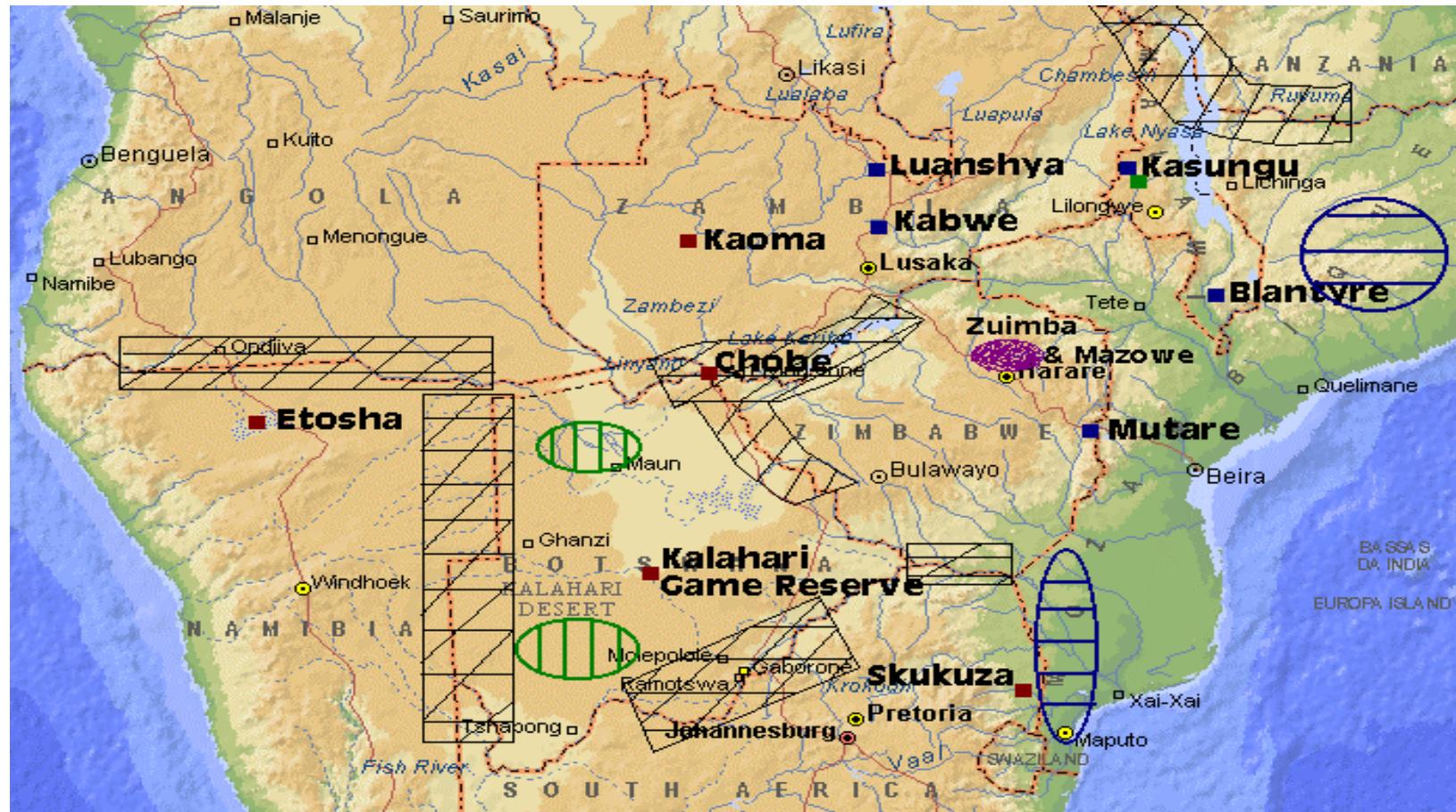
# Core site: SKUKUZA



Soil profiles (A and B) of moisture and temperature

▼ Soil moisture in profile A





**Key:**

PRJ ID.	PROJECT FOCUS & TYPE	LOCATION(S)
8	Vegetation changes (desk & field)	Zimbabwe, Botswana
9	Crop estimations (desk & field)	Zuiimba & Mazowe Districts
10	Woodland clearance hot spots (field)	Kabwe, Luanshya, Mutare, Blantyre Central & southern Moz.
11	Transboundary land use (desktop)	Various national boundaries
12	Miombo species & ecosystems (field)	Chimaliro Forest Reserve, Kasungu
13	EOS MODIS fire products validation	Etosha, Kaoma, Chobe, Central Kalahari Game Reserve, Skukuza
14	Range degradation (desktop)	Botswana, then to extend over region
15	Land cover change - Kalahari (field)	Matsheng & Okavango
57	Degradation of savannas (desktop)	SADC region, entire subcontinent of Africa
62	Pyrogenic emissions modelling	60 sites in southern Africa



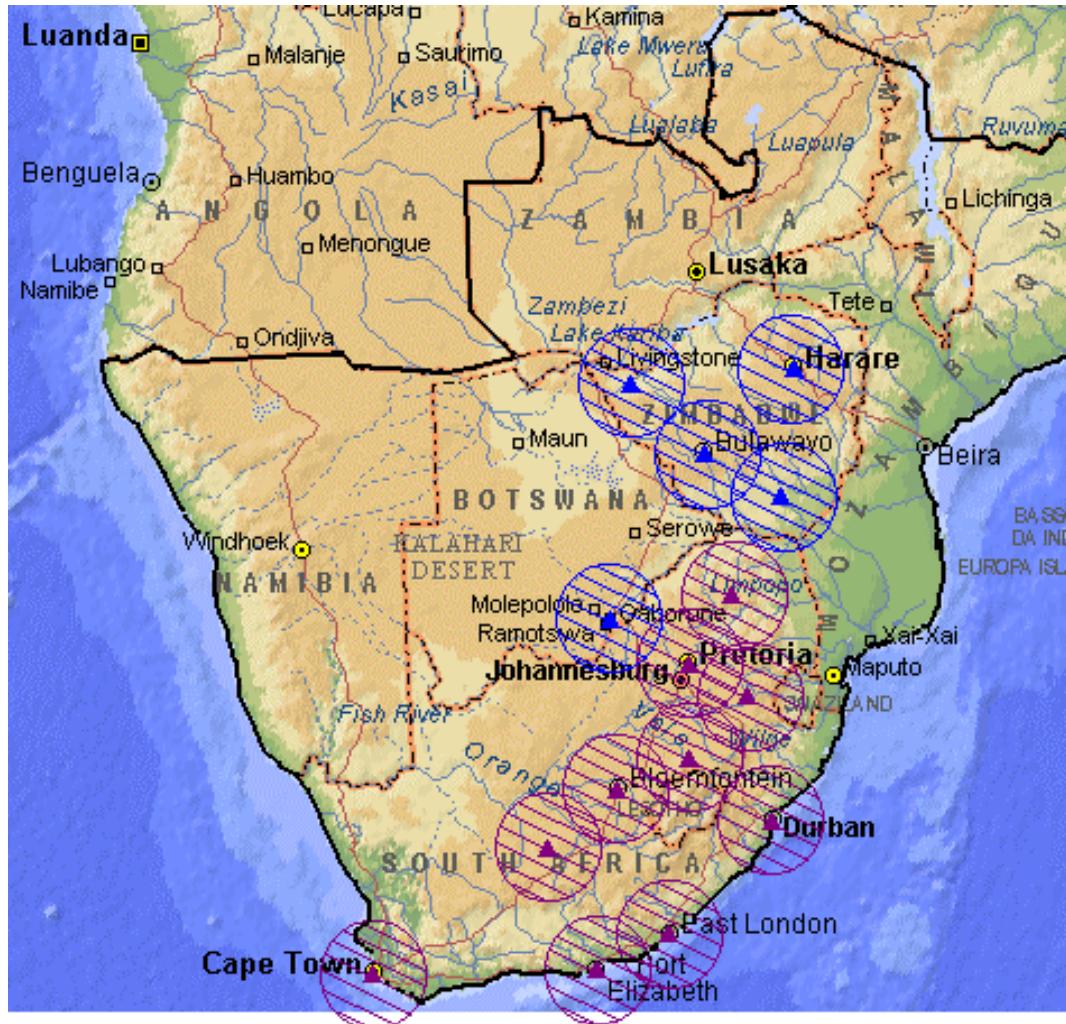
**Key:**

PRJ ID.	PROJECT FOCUS & TYPE	LOCATION(S)
50	Surface radiation balance (desktop & ground surveys)	Western Zambia - Mongu ▲ & Sesheke ▲



**Key:**

PRJ ID.	PROJECT FOCUS & TYPE	LOCATION(S)
18	Surface Temperature (desk & field)	Windhoek
20	Trajectory modelling (desktop)	<span style="color: purple;">■</span> Area for which modelling possible (based on requests)
21	Thermodynamic tropospheric structure (model location of stable layers)	



**Current Radar Coverage**



**Potential Radar Coverage**

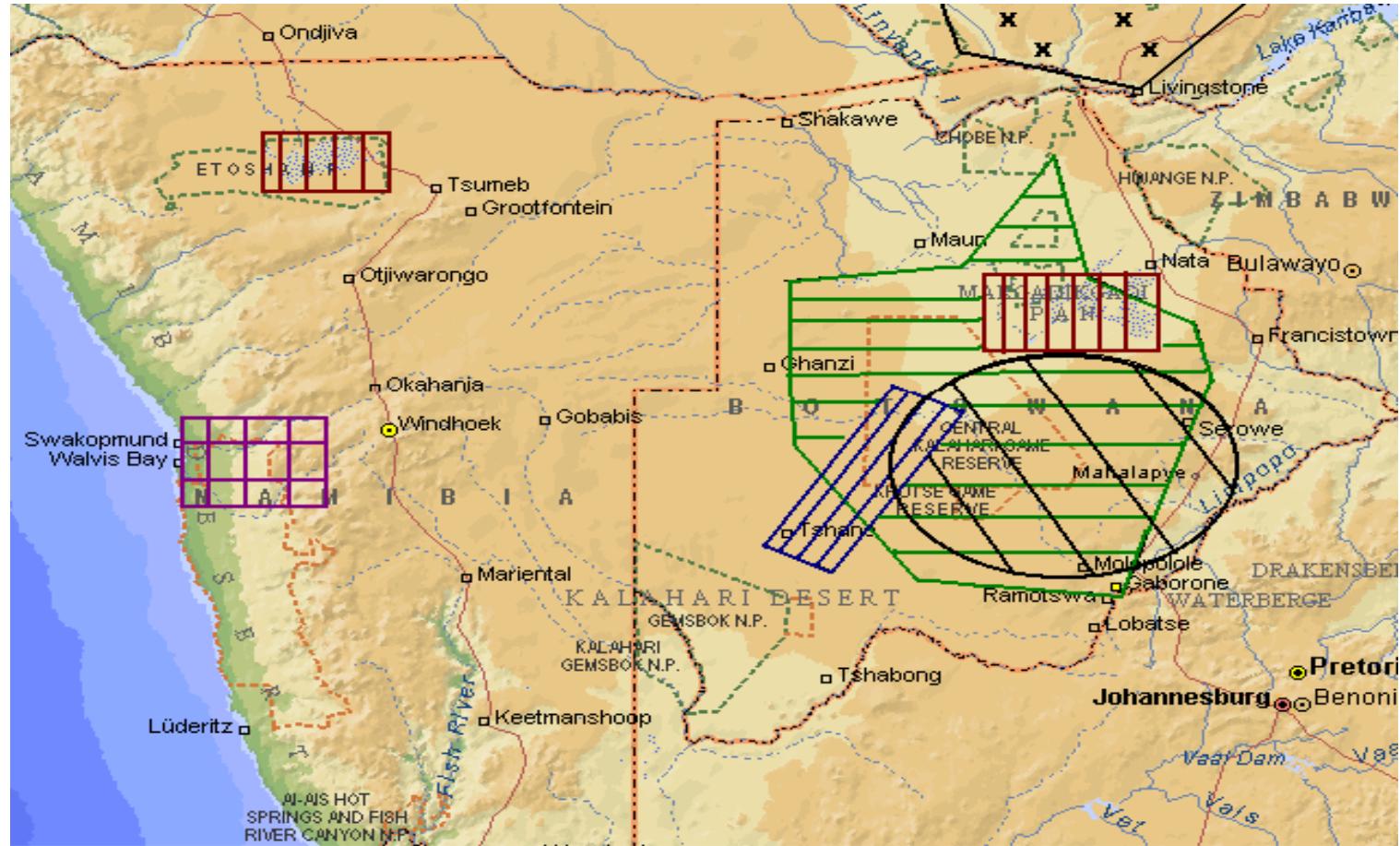


**Surface Rainfall Networks  
& Satellites (TRMM, Meteosat)**

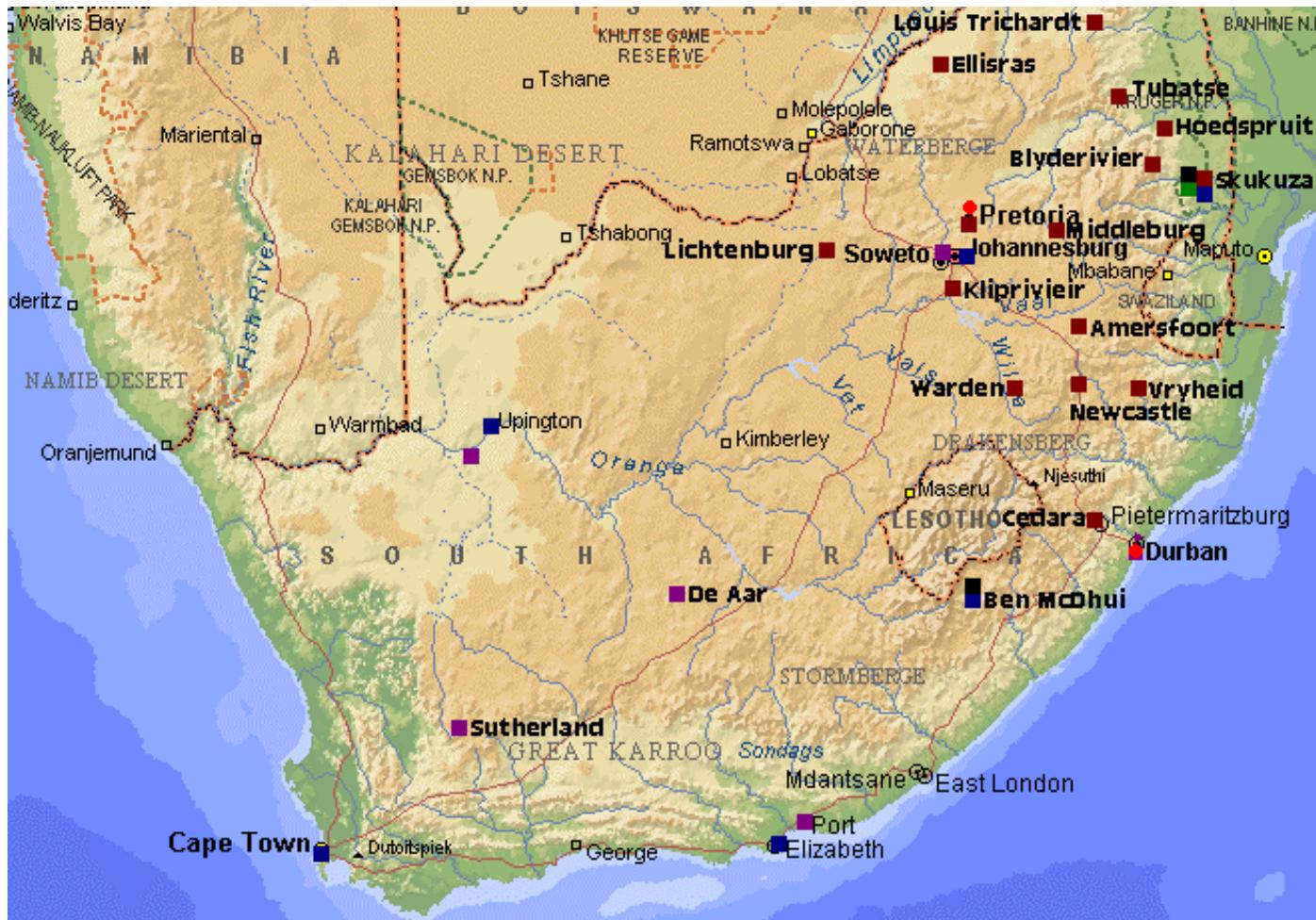


Key:

PRJ ID.	PROJECT FOCUS & TYPE	LOCATION(S)
1	Network/archive hydrology data (desk)	SADC
3	Okavango natural resources (desktop)	E Angola, N Botswana, Caprivi (Namibia) - see  area
4	Groundwater resources (desktop)	Namibia, Botswana
5	Groundwater potential (desktop)	Namibia, Botswana
6	Regional aquifers (desktop)	Botswana, Zimbabwe
7	Recharge determination (desk & field)	Serowa area  & Kalahari
66	Evapotranspir. & evap. (desk & field)	Mongu , Namibia, Zambia

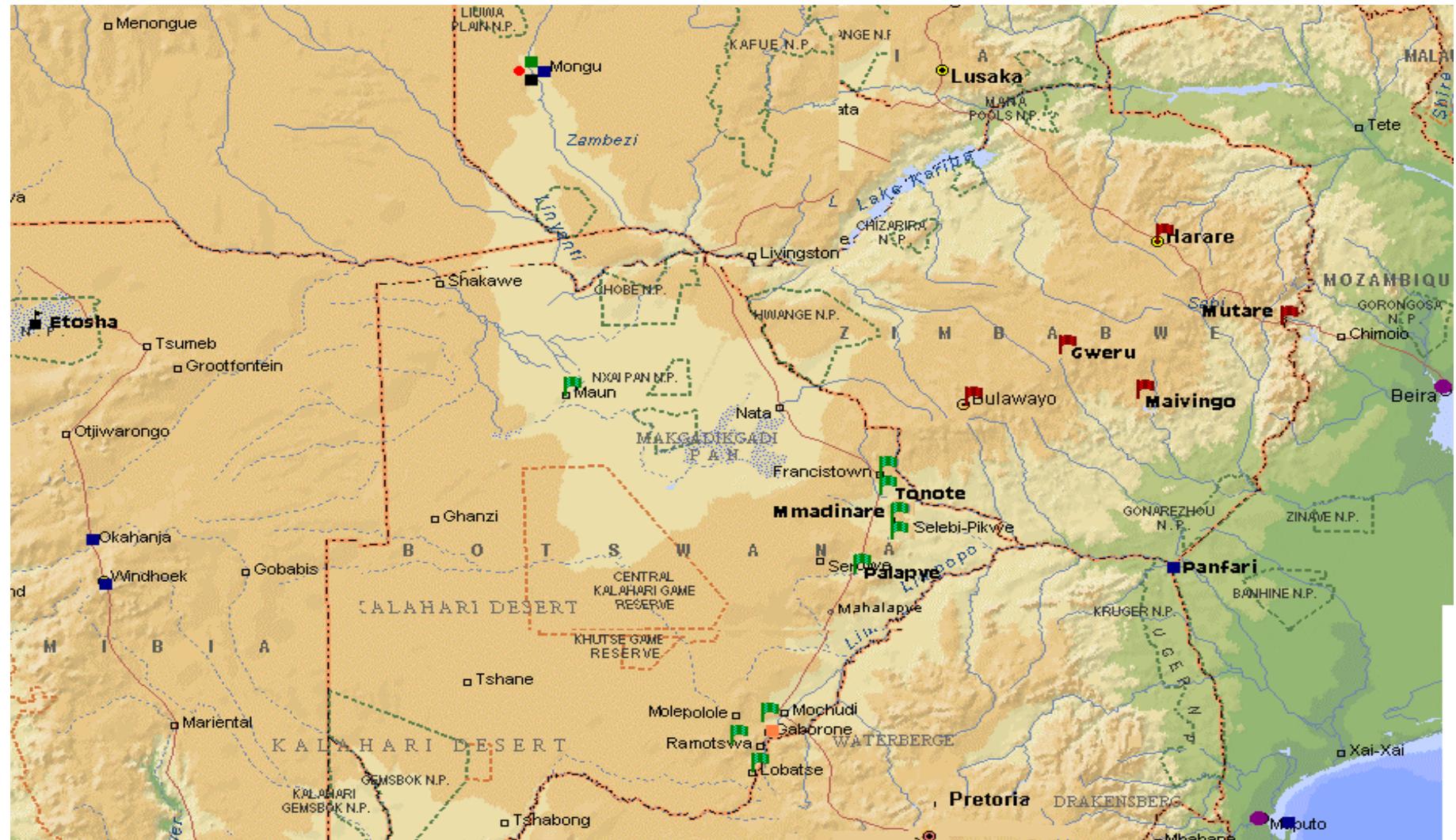


PRJ ID.	PROJECT FOCUS	
35	<b>Direct &amp; indirect atmospheric contributions to formation of evaporites at Sowa Pan</b>	
39	<b>Measurement of carbon flux using sun photometers for Tera validation</b>	
40	<b>Contribution of marine atmospheric DMS to terrestrial sulphur cycle (Central Namib Coastline)</b>	
41	<b>Pan surface material detection in soils of Makgadikgadi Pans (Botswana)</b>	
42	<b>Pan surface composition &amp; aerosol optical thickness at Etosha and Makgadikgadi Pans</b>	
74	<b>Column measurements of minor constituents by FTS (Botswana, mobile)</b>	
95	<b>Intermittent measurements of trace gases in Central/Western Botswana</b>	

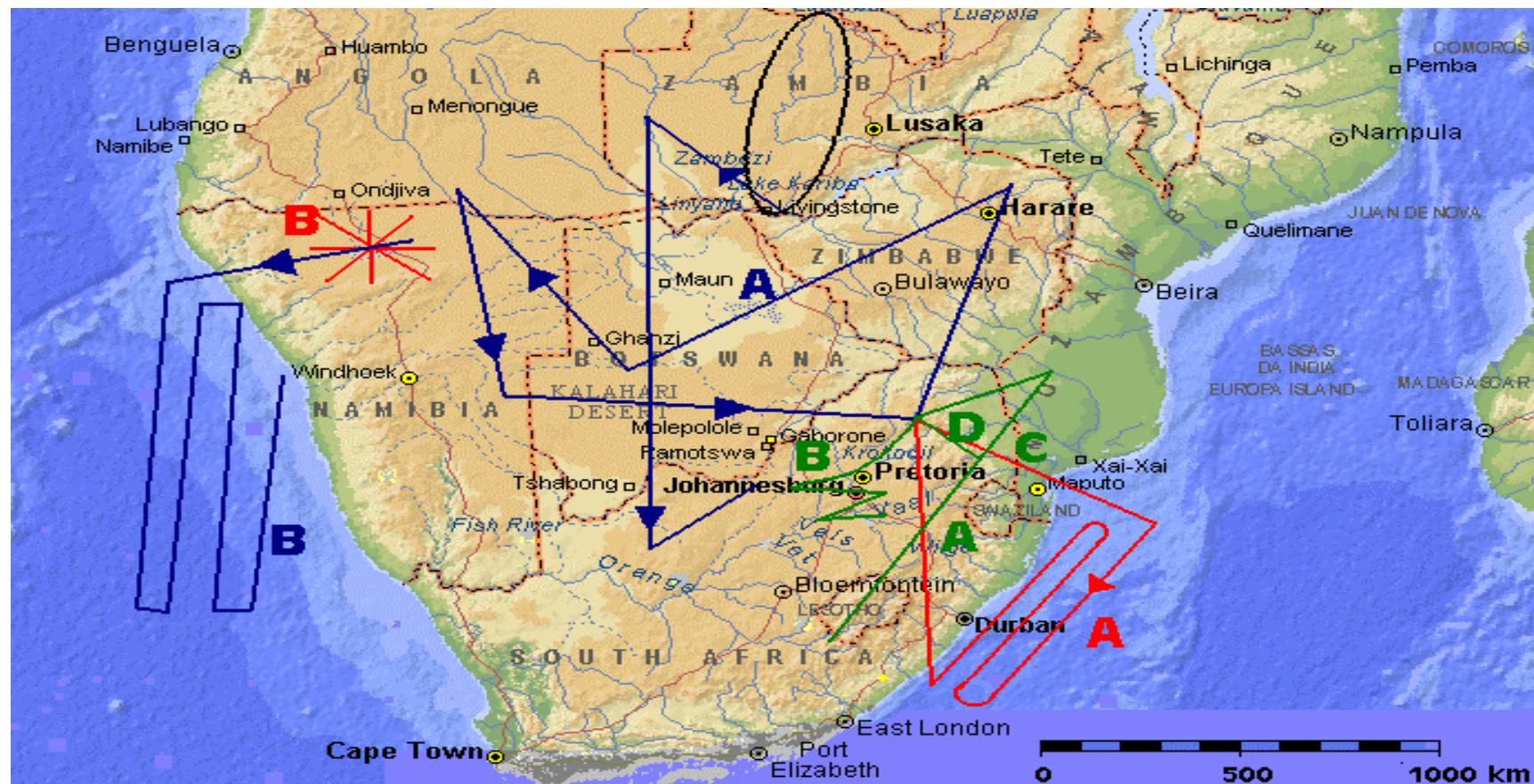


Key:

PRJ ID.	PROJECT FOCUS	
96	Diffusive trace gas sampling sites	■
97	wet deposition sampling sites	■
72	Evaluation and integration of EO-1 technologies	■
76-80	Aerosol characterisation & solar energy (sun photometer sites)	■
33	Aerosol sampling	■
44	Ozone & aerosol export studies (ozonesondes)	●
32	Ozone & aerosol profiles (ozonesondes)	●



PRJ ID.	PROJECT FOCUS	
96	Diffusive trace gas sampling sites	■
97	Wet deposition sampling sites	■
72	Evaluation and integration of EO-1 technologies	■
76-80	Aerosol characterisation & solar energy (sun photometer sites)	■
33	Aerosol sampling	■
73	Air quality monitoring in Mozambique	●
32	Ozone & aerosol profiles (ozonesondes)	●
34	Source characterisation (aerosols & trace gases) - Zimbabwe	○
36	Air quality monitoring in Botswana	■
46	Ground-based aerosol measurements - Gabarone	■



#### Flight Paths:

- A** ER-2 - Indian Ocean (clear/cloudy) Terra Validation
- B** ER-2 - Bidirectional reflection measurements (W/CV-580)
- A** ER-2 - Plume evaluation
- B** ER-2 - Namibian stratus & validation
- A** Aerocommander - ARREX - Long tract
- B** Aerocommander - ARREX - Plume flights
- C** Aerocommander - ARREX - Spirals
- D** Aerocommander - ARREX - Sector flights



Aerocommander - aircraft survey over Zambia  
(Katima - Lubumbashi - Mongu - Katima)